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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,000

08/18/2006

Alexander Apolonski

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2352 7590 12/17/2008  
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EXAMINER

HAGAN, SEAN P

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

12/17/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,000	<b>Applicant(s)</b> APOLONSKI ET AL.	
	<b>Examiner</b> SEAN HAGAN	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12 and 14-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12 and 14-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1 August 2008</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1 through 11 originally filed 11 May 2006. Claims 1 through 11 amended by amendment received 11 May 2006. Claims 1 through 11 cancelled by amendment received 14 January 2008. Claims 12 through 20 added by amendment received 14 January 2008. Claim 13 cancelled by amendment received 3 October 2008. Claim 21 added by amendment received 3 October 2008. Claims 12, 14, 15, 17, and 18 amended by amendment received 3 October 2008. Claims 12 and 14 through 21 are pending in this application.

### ***Response to Arguments***

2. Applicant's arguments have been fully considered but they are not persuasive.
3. Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.
4. To clarify examiner's position, the discussion leading up to the statement by applicants that claim 12 and all subsequent dependent claims are allowable over the prior art appears to contain a number of points relating to the minimum pulse duration and methods of mode-locking in the prior art, but none of these are actually claimed. It is possible that applicants feel the recitation relating to desired averaged net dispersion is what defines the claims over the prior art, but given the new terminology in claiming

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the averaged net dispersion so as to cover also net negative dispersion lasers, the points put forth do not appear to overcome the cited prior art or the prior art submitted in the most recent IDS. It is unclear which, if any, of these arguments are intended to be made.

5. With respect to newly amended limitations of claims 12 and 14 relating to the averaged dispersion being less than or equal to a particular value, these claims appear to be broader than previously presented similar claims. These limitations, as presently presented, appear to be read upon by any resonator which has a net negative dispersion. The rejection of these claims has been adjusted accordingly.

6. As such, all claims are addressed as follows:

***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 12, 14, 15, 16, 18, 19, 20, and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Cho et al. ("Generation of 90-nJ pulses with a 4-MHz repetition-rate Kerr-lens mode-locked Ti:Al<sub>2</sub>O<sub>3</sub> laser operating with net positive and negative intracavity dispersion," Opt. Lett. 26, 560-562 (2001), hereafter Cho) in view of Szipocs et al. (Szipocs, US Patent 5,734,503).

9. **Regarding claim 12**, Cho discloses, "A resonator comprising resonator components including a laser crystal" (Fig. 1). "A plurality of mirrors including a pump beam coupling-in mirror" (Fig. 1). "A laser beam out-coupling mirror and a multiple reflection telescope for enlarging the resonator length" (Fig. 1). "A first set of the resonator components having a positive dispersion" (pg. 561, col. 2, starting "Using positive dispersion mode locking..."). "Said resonator in operation having a positive averaged dispersion over an operating wavelength range" (pg. 561, col. 2, starting "Using positive dispersion mode locking..."). "Wherein the averaged dispersion of the resonator is  $\leq 100 \text{ fs}^2$ " (pg. 561, col. 1, last paragraph). Cho does not disclose, "Said plurality of mirrors including dispersive mirrors with a negative dispersion for compensating in part the positive dispersion of the first set of the resonator components." Szipocs discloses, "Said plurality of mirrors including dispersive mirrors with a negative dispersion for compensating in part the positive dispersion of the first set of the resonator components" (col. 3, lines 51-65). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs. The use of dispersive mirrors as disclosed by Szipocs would enhance the teachings of Cho by introducing more stable dispersive elements (Szipocs, col. 3, lines 51-65).

10. **Regarding claim 14**, Cho discloses, "Wherein the averaged dispersion is  $\leq 50 \text{ fs}^2$ " (pg. 561, col. 1, last paragraph).

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11. **Regarding claim 15**, Cho does not disclose, "Wherein the multiple reflection telescope comprises at least one of the dispersive mirrors with the negative dispersion." Szipocs discloses, "Wherein the multiple reflection telescope comprises at least one of the dispersive mirrors with the negative dispersion" (col. 3, lines 51-65). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs for the reasons given above regarding claim 1.

12. **Regarding claim 16**, Cho does not disclose, "Wherein all the mirrors of the resonator are the dispersive mirrors with the negative dispersion." Szipocs discloses, "Wherein all the mirrors of the resonator are the dispersive mirrors with the negative dispersion" (col. 3, lines 51-65). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs for the reasons given above regarding claim 1.

13. **Regarding claim 18**, Cho discloses, "Wherein the laser arrangement is configured to provide passive mode-locking" (pg. 560, col. 1, starting "In this Letter...").

14. **Regarding claim 19**, Cho discloses, "Wherein a Kerr-lens mode-locking principle is used for the passive mode-locking" (pg. 560, col. 1, starting "In this Letter...").

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15. **Regarding claim 20**, Cho discloses, "A saturable absorber positioned and configured to perform the passive mode-locking" (pg. 560, col. 1, starting "In this Letter...").

16. **Regarding claim 21**, Cho does not disclose, "Wherein an entirety of the negative dispersion of the resonator is determined only by the dispersive mirrors with the negative dispersion." Szipocs discloses, "Wherein an entirety of the negative dispersion of the resonator is determined only by the dispersive mirrors with the negative dispersion" (col. 5, lines 12-16). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs for the reasons given above regarding claim 1.

17. Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Cho in view of Szipocs and further in view of Cunningham et al. (Cunningham, US Patent 5,701,327).

18. **Regarding claim 17**, the combination of Cho and Szipocs does not disclose, "The resonator comprising a pair of glass wedges with positive dispersion configured to provide a supplementary dispersion fine adjustment." Cunningham discloses, "The resonator comprising a pair of glass wedges with positive dispersion configured to provide a supplementary dispersion fine adjustment" (col. 6, lines 42-44). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the

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teachings of the combination of Cho and Szipocs with the teachings of Cunningham. Inclusion of wedges for fine tuning pulse characteristics as taught by Cunningham would enhance the teachings of Cho and Szipocs by allowing for introduction of minute alterations of dispersion should such alterations present themselves as necessary.

### ***Conclusion***

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN HAGAN whose telephone number is (571)270-1242. The examiner can normally be reached on Monday-Friday 7:30 - 5:00.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun O. Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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/S. H./  
Examiner, Art Unit 2828

/Minsun Harvey/  
Supervisory Patent Examiner, Art Unit 2828